APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/066,318	02/01/2002	Pietro Perona	06618/776001/CIT 3395	9800

			EXAMINER
20985	7590	08/22/2006	STREGE, JOHN B

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ART UNIT	PAPER NUMBER
2624	

DATE MAILED: 08/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 August 2006*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,5-9,11,12,15-23,25,26 and 28* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,5-9,11,12,15-23,25,26 and 28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 January 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

Response to Amendment

1.   The amendment received 8/14/06 has been entered in full. Due to the

amendment the 112 rejections have been withdrawn.

Response to Arguments

2.   Applicant's arguments filed 8/14/06 have been fully considered but they are not

persuasive. Specifically the Applicant argues that Basri does nont teach or suggest

ignoring features that are not within the homologous parts. The Examiner respectfully

disagrees. Specifically Basri discloses "our computations are essentially local, in the

sense that only similarities between pairs of images that resemble each other matter for

the computation" (last paragraph of the conclusion). Thus Basri discloses using only

similar features to form a model.

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4.   Claims 1,5,7,9,17-20, and 22 are rejected under 35 U.S.C. 102(b) as being

anticipated by Basri et al. *Clustering appearances of 3D objects* (hereinafter "Basri").

Regarding claim 17, Basri discloses an article comprising: a machine readable

medium which stores machine-executable instructions, the instructions causing a

machine to: automatically analyze a plurality of training images (see the abstract, first

paragraph of the introduction, and the paragraph beginning on line 7 of column 2 on the

first page); establish correspondence between homologous parts in the plurality of

training images (paragraph beginning on line 25 of column 2 on the first page); and

automatically form a model for further recognition of said specified feature, using said

selected features (first paragraph of the introduction), and ignoring other features that

are not in said set of homologous parts (last paragraph of the conclusion).

Regarding claim 18, Basri discloses using eigenvectors to reduce the number of

detected features (section 4.1, eigenvalues are read as vector quantization).

Regarding claim 19, Basri discloses probabilistically estimating which of the

features are most informative for the model (section 4.2).

Regarding claim 20, Basri discloses instructions to assemble a matrix of feature

candidate positions indicating possible relevant parts, and statistically assessing

whether said relevant parts are likely to be useful (section 4.2).

Regarding claim 22, Basri discloses forming a model using a plurality of the

recognized parts (first paragraph of the introduction).

Regarding claim 1, Basri discloses a method, comprising: analyzing a plurality of

images which includes a specified desired feature therein to select a plurality of

selected features (see the abstract, first paragraph of the introduction, and the

paragraph beginning on line 7 of column 2 on the first page); and automatically

detecting features within said plurality of images (first sentence of the last paragraph of

section 2); automatically forming a model for further recognition of said specified

feature, using said selected features (first paragraph of the introduction); and vector

quantizing said automatically detected features to reduce the total number of detected

features (section 4.1 discloses eigenvalues, read as vector quantization), and clustering

among the vector quantized features, wherein said clustering also includes moving said

features to combine similar features which are spatially offset (fourth paragraph of

section 3), and using only those similar features to form a model (last paragraph of the

conclusion).

Regarding claim 5, Basri discloses probabilistically estimating which of the

features are most informative for the model (section 4.1 and 4.2).

Regarding claim 7, Basri discloses assembling a matrix of feature candidate

positions indicating possible relevant parts, and statistically assessing whether said

relevant parts are likely to be useful (section 4.1-4.3).

Regarding claim 9, Basri discloses forming a model using a plurality of

recognized parts (first paragraph of the introduction).

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6.   Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Basri

Clustering appearances of 3D objects in view of Burl et al. *Recognition of Planar Object*

Classes "hereinafter Burl").

Basri discloses automatically determining a model by assessing a function based on part appearance and shape (sections 4.1-4.3). Basri does not explicitly disclose that the function is a joint probability function.

Burl discloses automatically determining a model comprising assessing a joint probablilty function based on part appearance and shape to insure that the proper deformability is allowed (section 1, column 1, paragraph 2, line 6).

Basri and Burl are analogous art because they are from the same fiedld of endeavor of object clustering.

At the time of the invention it would obvious to one of ordinary skill in the art to combine Basri and Burl to assess a joint probability function. The motivation is that it would insure that the proper deformability is allowed in the model. Thus it would have been obvious to one of ordinary skill in the art to combine Basri and Burl to obtain the invention of claim 6.

7.   Claims 8 ,11-12, and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Basri *Clustering appearances of 3D objects* in view of Burl *Recognition of Planar Object Classes* and further in view of in view of Jojic et al. U.S. Patent 6,701,016 (hereinafter called Jojic).

Regarding claim 8, Burl nor Basri reveal the features of this claim. However, Jojic reveals the following:

A method wherein said joint probability function (col. 13, lines 3-5) is estimated using expectation maximization (col. 13, lines 51-54).

Burl and Jojic are analogous art because they both describe statistical models for

pattern recognition. Thus it would have been obvious to one of ordinary skill in the art to

combine the methods of Burl and Jojic because expectation maximization is a well-

known optimization method which is effective for graphical models (col. 13, lines 54-56).

Claim 11 is similarly analyzed to claim 8.

Regarding claim 12, Burl discloses using an interest operator on a plurality of

images (col. 2 section 2.1, paragraph 1).

Regarding claim 15, Basri discloses estimating which of the features are actually

most informative of the desired item to be recognized (section 4.1-4.3).

Claim 16 is similar to claim 8 with the additional limitation that the statistical

analysis establishes a correspondence between homologous parts across the training

set of images. Basri discloses this in the paragraph beginning on line 25 of column 2 on

the first page.

8.   Claim 23,25-26, and 28 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Burl *Recognition of Planar Object Classes* in view of Matthews USPN

6,633,670, and further in view of Basri *Clustering appearances of 3D objects.*

Regarding claim 23, Burl discloses the following:

An apparatus, comprising: A computer (i.e. SUN Sparc20, section 3, col. 1,

paragraph 1, line 10), forming:

A plurality of feature detectors (i.e. N types of features with a detector for each type,

section 2.1, paragraph 1, col. 2, lines 3-4), reviewing images to detect parts in the

images (i.e. Local detectors for these features were applied to each image, col. 1,

section 3, paragraph 2, lines 2-3) some of those parts will correspond to the foreground

as an instance of a target object class (i.e. object distribution, col. 2, section 2.3,

paragraph 4, lines 15-16), and other parts not being an instance of the target object

class, as part of the background (i.e. background distribution, col. 2, section 2.3,

paragraph 4, lines 16-17); and a hypothesis evaluation part, that evaluates candidate

locations identified by said plurality of feature detectors, to determine the likelihood of a

feature corresponding to an instance of said target object class (i.e. likelihood ratio,

equation 14, col. 2, section 2.3, paragraph 4). Furthermore Burl discloses assembling a

matrix of feature candidate positions indicating possible relevant parts (i.e. the locations

identified by a particular detector are treated as candidates for the actual feature. These

can be organized into a data structure W, section 2.1, col. 1, paragraph 2, lines 5-8),

and statistically assessing whether said relevant parts are likely to be useful (i.e. From

W, we can formulate hypotheses about which of the candidate locations actually

constitute an object, section 2.1, col. 1, paragraph 3, lines 1-3).

Burl does not explicitly disclose assigning variables representing the likelihood

that the parts in the matrix are from a foreground part or a background part. However it

is well known in clustering applications to do so.

Matthews discloses assigning a cluster of pixels to either the foreground or the

background (col. 4 lines 40-60).

Burl and Matthews are analogous art because they are from the same field of

endeavor of cluster analysis.

At the time of the invention it would have been obvious to one of ordinary skill in the art to combine Burl and Matthews to assign variables to the background or foreground in the matrix. The motivation for doing so is that is would allow for better classification of the objects.

Burl nor Matthews discloses forming a model based only on foreground parts.

Basri discloses that the computations are essentially local, in the sense that only similarities between pairs of images that resemble each other matter for the computation (last paragraph of the conclusion). This implies that in principle we do not have to compute the similarities between all pairs of images, but to consider only potiential candidates that may resemble one another thus reducing the computation required.

Basri, Burl, and Matthews are analogous art because they are from the same field of endeavor of cluster analysis.

At the time of the invention it would have been obvious to one of ordinary skill in the art to combine Basri, Burl, and Matthews to only used the foreground parts since it would reduce the computation required. Thus it would have been obvious to one of ordinary skill in the art to combine Basri, Burl, and Matthews to obtain the invention of claim 23.

Regarding claim 25, it is inherent that the class with the highest probability would be used to classify the image.

Claims 26 and 28 are similarly analyzed to claims 23 and 25.

Conclusion

9.   Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John B. Strege whose telephone number is (571) 272-7457. The examiner can normally be reached on Monday-Friday between the hours of 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta can be reached on (571) 272-7453. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JS

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